

Claims

1. A method of the remediation of toxic metal species from contaminated aqueous solutions volcanic rock; comprising the steps of placing the contaminated aqueous solutions in contact with the volcanic rock for a sufficient amount of time to remove or eliminate the contaminate from the aqueous solution.
2. The method in accordance with claim 1, where the volcanic rock may comprise of andesites, basalts, dacites, pumice, rhyolites and trachytes.
3. The method in accordance with claim 1, where the volcanic rock may comprise of a mixture of andesites, basalts, dacites, pumice, rhyolites and trachytes.
4. The method in accordance with claim 1, where the volcanic rock is from an ashflow tuff.
5. The method in accordance with claim 1, where the toxic metals comprise of the metals, metalloids, other metals, the associated organic complexes of the toxic metals, any other derived species of the toxic metals.
6. The method in accordance with claim 1, wherein the aqueous stream is passed over or through the volcanic rock.
7. The method in accordance with claim 1, wherein the volcanic rock is added to the aqueous solution.
8. The method in accordance with claim 1, wherein the volcanic rock is added in situ to groundwater.
9. A method for removing toxic metals from aqueous solutions wherein the ption of toxic metals by volcanic rock is enhanced by mixing it with zero valent iron,

oxidized iron derivatives and activated carbon to create a binding system for use with aqueous solutions.

- 5 10. The binding system in accordance with claim 9, where
the toxic metals comprise of the metals, metalloids, other
metals, the associated organic complexes of the toxic
metals, any other derived species of the toxic metals.
- 10 11. The binding system in accordance with claim 9, where
the volcanic rock may comprise of andesites, basalts,
dacites, pumice, rhyolites, trachytes.
- 15 12. The binding system in accordance with claim 9, where
the volcanic rock may comprise of a mixture of andesites,
basalts, dacites, pumice, rhyolites, trachytes.
- 20 13. The binding system in accordance with claim 9, where
the volcanic rock is from an ashflow tuff.
- 25 14. The binding system in accordance with claim 9,
wherein the aqueous stream is passed over or through the
volcanic rock.
- 30 15. The binding system in accordance with claim 9,
wherein the volcanic rock is added to the aqueous solution.
- 35 16. The binding system in accordance with claim 9, wherein
the volcanic rock is added in situ to groundwater.
17. The binding system in accordance with claim 9, wherein
varying amounts of zero valent iron and oxidized iron
derivatives and activated carbon are mixed or layered in
the binding system.